

## Electronics and Communication Engineering (EC)

### Curriculum Outline

Electronics and Communication Engineering are among the most challenging fields of study in electrical engineering. The areas of study in electronics and communication engineering are quite diverse. The curriculum is therefore developed to include many major study areas so that students will be well prepared for work in the highly competitive electronics and communication engineering professions.

Compulsory courses are designed to provide students broad knowledge in electronics and communication engineering, which is necessary to satisfy general needs of industrial sectors in Thailand. The compulsory courses include four laboratory courses in electrical engineering, which are provided to illustrate practical aspects of electric circuits, electronics, feedback control, signal processing and communications. By the end of the third year, students will complete most of compulsory courses, except for courses related to seminars and senior projects, which will be taken in the fourth year.

After gaining sufficient basic knowledge through the compulsory courses, students can choose compulsory elective courses available in three major areas: Communications, Electronics, and Mechatronics, in the fourth year. The Communications Area concentrates study on advanced communication systems such as optical and mobile communication systems. The Electronics Area focuses on solid state technology, microelectronics and advanced electronic circuit design. The Mechatronics Area provides fundamental and intermediate courses in mechatronics, robotics, and advanced control systems.

In addition, courses for topics in communications are also offered as technical elective courses in order to cope with rapid changes in technology and highly diverse areas of studies in communication engineering. During the last semester, students have options to go for an exchange abroad, to participate in extended training program with leading local companies, or to work on senior projects with SIIT advisors.

### Structure and Components

1.	General Basic Courses	33 Credits
	1.1 Humanities	6 Credits
	1.2 Social Sciences	6 Credits
	1.3 English Language	9 Credits
	1.4 Science and Mathematics	12 Credits
2.	Core Courses	111 Credits
	2.1 Compulsory Courses	93 Credits
	2.2 Compulsory Elective Courses	12 Credits
	2.3 Technical Elective Courses	6 Credits
3.	Free Elective Courses	6 Credits
<b>Total</b>		<b><u>150</u> Credits</b>

### Details of the Curriculum

1.	General Basic Courses	33 Credits
	1.1 Humanities (2 courses) TU 110 TU 140	6 Credits
	1.2 Social Sciences (2 courses) EC 210 TU 120	6 Credits
	1.3 English Language (3 courses) EL 171 EL 172 EL 210	9 Credits
	1.4 Science and Mathematics (4 courses) GTS 132 GTS 133 ITS 050 TU 130	12 Credits
2.	Core Courses	111 Credits
	2.1 Compulsory Courses	93 Credits
	2.1.1 Science and Mathematics	21 Credits
	MAS 116 MAS 117 MAS 210 SCS 126 SCS 138 SCS 139 SCS 176 SCS 183 SCS 184	
	2.1.2 Non-EC Courses	14 Credits
	EMS 211 GTS 302 IES 303 MCS 352 MES 351	
	2.1.3 EC Courses	58 Credits
	ECS 310 ECS 313 ECS 315 ECS 316 ECS 317 ECS 318 ECS 319 ECS 320 ECS 321 ECS 331 ECS 332 ECS 361 ECS 370 ECS 371 ECS 372 ECS 380 ECS 381 ECS 382 ECS 395 ECS 396 ECS 450 ECS 472 (ECS 398 and ECS 300) or (ECS 399) or (ECS 496 and ECS497 and ECS 300))	
	2.2 Compulsory Elective Courses	12 Credits
	Select 4 courses (12 credits) from the following courses: ECS 322 ECS 323 ECS 424 ECS 425 ECS 427 ECS 431 ECS 441 ECS 442 ECS 451 ECS 452 ECS 455 ECS 456 ECS 462 ECS 475 ECS 477 ECS 478 ECS 483 MCS 321 MCS 361 MCS 451 MCS 483	
	2.3 Technical Elective Courses	6 Credits
	Select 6 credits from a list of courses offered by SIIT, except basic courses. XXS xxx	
3.	Free Elective Courses	6 Credits
	Select any courses offered by the university, except basic courses. XXX xxx	
<b>Total Credit Requirement</b>		<b><u>150</u> Credits</b>

## EC Curriculum : 150 Credits

### First Year

<i>Semester I</i>	<i>Credits (lecture-practice-self study hrs)</i>
EL 171 English Course II	3(3-1-5)
ITS 050 Intro. to Computers and Programming	3(2-3-4)
MAS 116 Mathematics I	3(3-1-5)
SCS 126 Chemistry for Engineers	3(3-1-5)
SCS 138 Applied Physics I	3(3-1-5)
SCS 176 Chemistry Laboratory	1(0-3-0)
SCS 183 Physics Laboratory I	1(0-3-0)
TU 130 Integrated Sciences and Technology	3(3-0-6)
<b>Sub-Total</b>	<b>20(17-13-30)</b>

### *Semester II*

EL 172 English Course III	3(3-1-5)
GTS 132 Introduction to Life Science	3(3-1-5)
GTS 133 Environmental Studies	3(2-2-5)
MAS 117 Mathematics II	3(3-1-5)
SCS 139 Applied Physics II	3(3-1-5)
SCS 184 Physics Laboratory II	1(0-3-0)
TU 140 Thai Studies	3(3-0-6)
<b>Sub-Total</b>	<b>19(17-9-31)</b>

### Second Year

<i>Semester I</i>	<i>Credits (lecture-practice-self study hrs)</i>
ECS 313 Electrical Engineering Mathematics	3(3-0-6)
ECS 316 Circuit Analysis	3(3-1-5)
ECS 317 Computer Graphics and Tools in Electrical Engineering	3(2-2-5)
EL 210 English for Engineering I	3(3-1-5)
MAS 210 Mathematics III	3(3-1-5)
MES 351 Engineering Dynamics	3(3-1-5)
TU 120 Integrated Social Science	3(3-0-6)
<b>Sub-Total</b>	<b>21(20-6-37)</b>

### *Semester II*

ECS 310 Basic Electrical Engineering Laboratory	1(0-3-0)
ECS 318 Data Structures, Algorithms, and Object Oriented Programming	3(2-2-5)
ECS 321 Electronic Circuits I	3(3-0-6)
ECS 331 Electromagnetics	3(3-0-6)
ECS 361 Electrical Measurement and Instrumentation	3(3-0-6)
ECS 371 Digital Circuits	3(3-0-6)
ECS 372 Signals and Systems	3(3-0-6)
GTS 302 Technical Writing	2(2-1-3)
<b>Sub-Total</b>	<b>21(19-6-38)</b>

## EC Curriculum : 150 Credits

### Third Year

#### Semester I

EC 210	Introductory Economics	3(3-1-5)
ECS 315	Probability and Random Processes	3(3-0-6)
ECS 319	Java Programming	3(2-2-5)
ECS 320	Electronic Circuits Laboratory	1(0-3-0)
ECS 332	Principles of Communications	3(3-0-6)
ECS 370	Digital Circuit Laboratory	1(0-3-0)
ECS 381	Feedback Control Systems	3(3-0-6)
ECS 382	Microprocessors	3(3-0-6)
	<b>Sub-Total</b>	<b>20(17-9-34)</b>

#### Semester II

ECS 380	Feedback Control Laboratory	1(0-3-0)
ECS 450	Signal Processing and Communication Laboratory	1(0-3-0)
ECS 472	Digital Signal Processing	3(3-0-6)
E/M-CS xxx	Compulsory Elective Course	3(3-0-6)
EMS 211	Thermofluids	3(3-1-5)
MCS 352	Microcontroller and Computer Interfacing	3(3-0-6)
TU 110	Integrated Humanities	3(3-0-6)
XXS xxx	Technical Elective	3(x-x-x)
	<b>Sub-Total</b>	<b>20(x-x-x)</b>

#### Summer

ECS 300	Electronics and Communication Engineering Training	0(0-0-0)
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#### Remarks

Students, who take ECS 399 Extended Electronics and Communication Engineering Training in the second semester of their fourth year, are exempted from ECS 300 Electronics and Communication Engineering Training and are advised to complete 6 credits of Free Electives by the first semester of their fourth year.

### Fourth Year

#### Semester I

ECS 395	Seminar	1(0-3-0)
ECS 396	Project Development	1(0-3-0)
E/M-CS xxx	Compulsory Elective Courses	3(3-0-6)
E/M-CS xxx	Compulsory Elective Courses	3(3-0-6)
E/M-CS xxx	Compulsory Elective Courses	3(3-0-6)
IES 303	Engineering Management and Cost Analysis	3(3-0-6)
XXS xxx	Technical Elective	3(x-x-x)
	<b>Sub-Total</b>	<b>17(x-x-x)</b>

#### List of Compulsory Elective Courses

##### Communications Area

ECS 441	Communication Electronics	3(3-0-6)
ECS 442	Microwave Principles	3(3-0-6)
ECS 451	Data Communications and Networks	3(3-0-6)
ECS 452	Digital Communication Systems	3(3-0-6)
ECS 455	Mobile Communications	3(3-0-6)
ECS 456	Optical Communications	3(3-0-6)
ECS 462	Antennas	3(3-0-6)
ECS 477	Signal Processing for Communication Systems	3(3-0-6)

##### Electronics Area

ECS 322	Electronic Circuits II	3(3-0-6)
ECS 323	Physical Electronics	3(3-0-6)
ECS 424	Analog Integrated Circuits	3(3-0-6)
ECS 425	Digital Integrated Circuits	3(3-0-6)
ECS 427	Introduction to VLSI Design	3(3-0-6)
ECS 431	Industrial Electronics	3(3-0-6)

##### Mechatronics Area

ECS 478	Introduction to Computer Vision and Pattern Recognition	3(3-0-6)
ECS 475	Digital Image Processing	3(3-0-6)
ECS 483	Linear System Theory	3(3-0-6)
MCS 321	Real-time and Embedded Systems	3(3-0-6)
MCS 361	Mechatronic Instrumentation	3(3-0-6)
MCS 451	Introduction to Robotics	3(3-0-6)
MCS 483	Dynamic Systems and Control	3(3-0-6)

#### Semester II

XXX xxx	Free Electives	3(x-x-x)
XXX xxx	Free Electives	3(x-x-x)

and one of the following 3 tracks:

<b>1) Senior Project Track</b>		
ECS 398	Senior Project	6(0-18-0)
<b>2) Foreign Exchange Track</b>		
ECS 496	Special Study in EC I	3(3-0-6)
ECS 497	Special Study in EC II	3(3-0-6)
<b>3) Extended Training Track</b>		
ECS 399	Extended Electronics and Communication Engineering Training	6(0-40-0)
	<b>Sub-Total</b>	<b>12(x-x-x)</b>